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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/812,765	03/29/2004	Norihiro Arai	04199/LH	4800

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EXAMINER	
CHEN, WEN YING PATTY	

ART UNIT	PAPER NUMBER
2871	

DATE MAILED: 06/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/812,765	ARAI ET AL.	
	Examiner	Art Unit	
	W. Patty Chen	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 April 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8 and 10-18* is/are pending in the application.

4a) Of the above claim(s) *2,4-6 and 12* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,7,8,10,11 and 13-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on Apr. 13, 2006 has been entered.

Response to Amendment

Applicant's Amendment filed Mar. 20, 2006 has been received and entered. Claims 1-8 and 10-18 are pending in the current application, but claims 2, 4-6 and 12 are withdrawn from consideration.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 3, 8, 10-11 and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Song et al. (US 6614496) in view of Fujimori et al. (US 2003/0063244).

With respect to claims 1 and 17 (Amended): Song et al. disclose in Figures 5, 6 and 9 a liquid crystal display device comprising:

a liquid crystal element comprising:

a front substrate (element 106) which is arranged at a front side of the liquid crystal element, which corresponds to a viewing screen side of the display device;

a back substrate (element 108) which is arranged at a back side of the front substrate so as to be opposed to the front substrate;

at least one thin film transistor (element T) which is arranged on the internal surface of the back substrate and driven by a drive signal;

at least one second electrode (element 70) which comprises a transparent conductive film arranged on the internal surface of the back substrate so as to be opposed to the at least one first electrode, and is connected to the thin film transistor (through element 66), thereby forming at least one pixel in a region that does not overlap with a region where the thin film transistor is formed (as shown in Figure 5) and that is included in an area where the at least one first electrode and the at least one second electrode are opposed to each other;

a liquid crystal layer (element 100) which is sandwiched between the front substrate and the back substrate;

at least one reflective film (element 68) which is positioned between the second electrode and the internal surface of the back substrate (as shown in Figure 6D) so as to correspond to a part of the region in which the at least one pixel is formed that does not overlap with the region where the thin film transistor is formed (as shown in Figure 5), such that a reflective portion for reflecting incident light and a transmissive portion (element 72), in a region other than the reflective portion, for transmitting incident light are formed in the at least one pixel;

a color filter (element 104) which is provided on the internal surface of the front substrate so as to correspond to the at least one pixel;

a front polarizing plate and a back polarizing plate which are arranged at the front side and a back side of the liquid crystal element, respectively (Column 7, lines 2-6); and

a backlight (element 102) which is arranged at a back of the back polarizing plate.

Song et al. fail to disclose at least one first electrode formed on the internal surface of the front substrate and that an opening is formed by removing the color filter at a position such that the opening corresponds to a part of the reflective portion, and that a liquid crystal layer thickness adjusting layer is provided in at least a region corresponding to the reflective portion between the front substrate and the back substrate, in order to set a thickness of the liquid crystal layer in the reflective portion to be thinner than a thickness of the liquid crystal layer in the transmissive portion.

However, Fujimori et al. disclose in Figure 16 a liquid crystal display device comprising one first electrode (element 46) formed on the internal surface of the front substrate and a color filter (element 42) at a position such that the opening (element 42') corresponds to a part of the reflective portion, and that a liquid crystal layer thickness adjusting layer (elements 44a1' and 44a2', having diffusion properties) is provided in at least a region corresponding to the reflective portion between the front substrate and the back substrate, in order to set a thickness of the liquid crystal layer (element 50) in the reflective portion to be thinner than a thickness of the liquid crystal layer in the transmissive portion.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to construct a liquid crystal display device as taught by Song et al. wherein at least one first electrode is formed on the internal surface of the front substrate and that the color filter comprises of openings corresponding to the reflective region in which a thickness

adjusting layer is provided on the color filter corresponding to the openings such that the thickness of the liquid crystal layer at the reflective region is thinner than a thickness of the liquid crystal layer in the transmissive region as taught by Fujimori et al., since Fujimori et al. teach that in order to produce an active matrix type LCD device, a first electrode must be formed on the opposing substrate as the pixel electrode (Paragraph 0062) and that by forming the color filter have such characteristics the scattering of the light at the reflection portion can be enhanced (Paragraph 0146).

As to claims 3: Fujimori et al. further disclose in Figure 16 that a thickness of the liquid crystal layer thickness adjusting layer (elements 44a1' and 44a2') is set such that a thickness of the color filter (element 42) in the reflective portion is equal to a thickness of the color filter in the transmissive portion.

As to claim 8: Fujimori et al. further disclose in Paragraph 0146 that the liquid crystal layer thickness adjusting layer comprises a transparent insulation film.

As to claim 10: Fujimori et al. further disclose in Figure 16 that the liquid crystal layer thickness adjusting layer (elements 44a1' and 44a2') fills the hole (element 42') formed in the color filter (element 42).

As to claim 11: Fujimori et al. further disclose in Figure 16 that the liquid crystal layer thickness adjusting layer (elements 44a1' and 44a2') fills the hole (element 42') formed in the color filter (element 42) and covers the color filter.

As to claim 18: Fujimori et al. further disclose in Figure 16 that a thickness of the liquid crystal layer thickness adjusting layer (elements 44a1' and 44a2') is set such that a thickness of the color filter (element 42) in the reflective portion is equal to a thickness of the color filter in

the transmissive portion and that the liquid crystal layer thickness adjusting layer (elements 44a1' and 44a2') fills the hole (element 42') formed in the color filter (element 42) and covers the color filter.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Song et al. (US 6614496) and Fujimori et al. (US 2003/0063244) in view of Baek (US 2002/0041351).

Song et al. and Fujimori et al. disclose all of the limitations set forth in claim 1, but fail to specifically disclose that the liquid crystal element comprises a homogeneous liquid crystal layer.

However, Baek discloses in the Abstract a transflective liquid crystal display device including a homogeneous liquid crystal in which liquid crystal molecules are oriented substantially in parallel with surfaces of a pair of substrate without being twisted between the substrates in a non electric field state where no electric field is applied.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to construct a liquid crystal display device as taught by Song et al. and Fujimori et al. wherein the liquid crystal layer is of a homogeneous liquid crystal as taught by Baek, since Baek teaches that by having homogeneous liquid crystal allows the display to exhibit an optical retardation when the voltage is applied so that a high contrast ratio can be achieved (Abstract).

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Song et al. (US 6614496) and Fujimori et al. (US 2003/0063244) in view of Ha (US 2003/0160914).

Song et al. and Fujimori et al. disclose all of the limitations set forth in claim 1, but fail to disclose that the reflective layer comprises a reflective surface on which depressions and protrusions are formed.

However, Ha discloses in Figure 4 a liquid crystal display device comprising a reflective layer (element 19b), which comprises a reflective surface on which depressions and protrusions are formed.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to construct a liquid crystal display device as taught by Song et al. and Fujimori et al. wherein the reflective layer comprises a reflective surface on which depressions and protrusions are formed as taught by Ha, since Ha teaches that the uneven reflective surface results in minimized specular reflection and improves diffusion of incident light (Paragraph 0025).

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Song et al. (US 6614496) and Fujimori et al. (US 2003/0063244) in view of Ozawa et al. (US 2004/0004681).

Song et al. and Fujimori et al. disclose all of the limitations set forth in claim 1, but fail to specifically disclose that the liquid crystal layer in the reflective portion exhibits a retardation of ¼ wavelength and the transmissive portion exhibits a retardation of ½ wavelength to a light transmitted through in the non electric field state.

However, Ozawa et al. disclose in the Abstract a transflective liquid crystal display device wherein in transmissive display regions and the reflective display regions are set to a ½ wavelength and a ¼ wavelength respectively, with no voltage applied.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to construct a liquid crystal display device as taught by Song et al. and Fujimori et al. wherein the liquid crystal layer in the reflective portion exhibits a retardation of ¼ wavelength and the transmissive portion exhibits a retardation of ½ wavelength to a light transmitted through in the non electric field state as taught by Ozawa et al., since Ozawa et al. teach that with such configuration of the liquid crystal layer an improved display brightness in the transmission mode and an excellent visibility can be achieved (Abstract).

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Song et al. (US 6614496), Fujimori et al. (US 2003/0063244) and Ozawa et al. (US 2004/0004681) in view of Baek (US 2002/0041351).

Song et al., Fujimori et al. and Ozawa et al. disclose all of the limitations set forth in claim 14 and Song et al. further discloses in Paragraph 0012 that the liquid crystal display device further comprising: a front retardation plate and a back retardation plate arranged between the polarizing plates and the liquid crystal layer.

Song et al., Fujimori et al. and Ozawa et al. fail to specifically disclose that the slow axes of the retardation plates are orthogonal to each other and that the transmission axes of the polarizing plates are orthogonal to each other.

However, Baek discloses in Figure 6 a transflective display device comprising of lower and upper retardation plates (elements 142 and 145) and lower and upper polarizing plates (elements 152 and 155), wherein the slow axes of the retardation plates are perpendicular to each

other and the transmission axes of the polarizing plates are perpendicular to each other (Paragraph 0081) so as to offset the optical retardation of the liquid crystal layer.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to construct a liquid crystal display device as taught by Song et al., Fujimori et al. and Ozawa et al. wherein the slow axes of the retardation plates are orthogonal to each other and that the transmission axes of the polarizing plates are orthogonal to each other as taught by Baek, since Baek teaches that such configuration of the polarizing plates and the retardation plates help to prevent light leakage when displaying the dark state of the LCD device (Paragraph 0081).

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Song et al. (US 6614496), Fujimori et al. (US 2003/0063244), Ozawa et al. (US 2004/0004681) and Baek (US 2002/0041351) in view of Iijima (US 2002/0154257).

Song et al., Fujimori et al., Ozawa et al. and Baek disclose all of the limitations set forth in claim 15, but fail to disclose that a scattering reflective plate is arranged between the front polarizing plate and the liquid crystal layer.

However, Iijima discloses in Figure 18 a scattering reflective plate (element 16) arranged between the front polarizing plate (element 13) and the liquid crystal layer (element 4).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to construct a liquid crystal display device as taught by Song et al., Fujimori et al., Ozawa et al. and Baek wherein a scattering reflective plate is arranged between the front

polarizing plate and the liquid crystal layer as taught by Iijima, so that the image light of the display is uniformly scattered towards the viewer.

Response to Arguments

Applicant's arguments with respect to all claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to W. Patty Chen whose telephone number is (571)272-8444. The examiner can normally be reached on 8:00-5:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David C. Nelms can be reached on (571)272-1787. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

W. Patty Chen
Examiner
Art Unit 2871

WPC
6/22/06

ANDREW SCHECHTER
PRIMARY EXAMINER